CRITICISMS OF COVID 19 VERSUS THE SLOW RESPONSE OF OUR LEADERS TO GLOBAL WARMING AND DEPLETION OF THE WORLD'S MINERALS WITH THE RESPONSE BY LEADERS

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ABSTRACT: *This research paper reviews a broad range of the literature on three topics Firstly COVID 19 pandemic. Secondly on responses by or leaders to global warming Thirdly on depletion of the world's mineral resources. In terms of research design each of these three topics utilizes a critique of a selection of classical and current published documentary research. From narrative and documentary research sources. The purpose of this research is to stimulate discussion and more importantly immediate action by all members of the community. The paper highlights issues important to continuance of all life on our planet.*

Keywords: *COVID 19; Global Warming; Depletion of the World's Minerals*

Introduction

We are all experiencing the immediate and continuing impacts on our lives of the COVID 19 pandemic and these impacts will likely continue into the foreseeable future. Possible development of one or more vaccines by several nations and the development of topical medicines will likely lessen the day-to-day impacts for those fortunate enough to have access to those remedies. However, it is likely that most of humanity living in destitute poverty, will not have access to those remedies in the short term and possibly not even in the long term. Without vaccination of all the presence of COVID 19 will persist into the foreseeable future. This comment is based on the earlier examples of polio and malaria both scourges from last century, which even today continue to threaten humankind, so many years after vaccines and topical medicines were administered to many of the world's peoples. The second part of this research paper discusses "glacially slow" response of our government leaders to global warming and possible reasons for that slow response among them big money politics. The third part of this paper discusses depletion of the world's stock of mineral wealth and suggests over population and our wasteful consumer life style. In each of these three topics a qualitative analysis is made of a combination of current literature and online media sources.

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The Rapid Response to COVID 19

The occurrence of COVID 19 has caught the world's government leaders and population's attention and prompt action in a way that pollution of our environment, global warming and depletion of the world's mineral stocks have failed to do. (Brookings 2020).

COVID 19 immediately threatens many of our lives. Some people who contract this disease show no signs of infection; (they are asymptomatic) and go on to infect many others They are termed "super spreaders". As of September 2020, around 24,854,140 confirmed cases of COVID-19, including 838,924 deaths, reported to WHO. (WHO Corona Virus Dashboard (2020).

Sixty to eighty per cent of those infected who show symptoms of the disease recover, but recovery is often prolonged and painful; whilst around 3 per cent of those infected succumb to the disease. However, like most diseases, Covid 19 will likely ultimately be controlled through development and application of a vaccine and or topical medicines. (WHO Corona Virus Dashboard (2020).

Those who become infected and who recover may achieve some level of immunity. The mortality rate of those infected currently varies between 1 to 3 per cent, moreover, many of those deaths are in the elderly, whose immune systems are compromised by underlying health issues of the heart, lung or kidney. Those infected in the population varies greatly depending upon their ability or willingness to self-isolate, observe social distancing and regularly wash their hands, wear face- masks and disinfect their premises and means of transport. Age is a significant factor. The elderly and infirm have a greater likelihood of dying from COVID 19 due to their weaker immune systems. The recovery rate varies from 60 to 80 per cent of the broader population. (cdc.gov,2020).
Compared with other serious situations facing humankind such as pollution and global warming, the critical question remains "Why have national leaders responded so quickly to COVID 19 and so slowly to Global Warming and depletion of the world's mineral stock?" The author attempts to explain this by summarizing five possible reasons drawn for currently published research.

Three Possible Reasons for The Rapid Response by our Leaders to Covid 19 and their slow Response to Global Warming and Depletion of Mineral Stocks

One reason why government have responded so quickly to the COVID 19 outbreak is to limit spread of the virus and its devastating influence on the world economy. A second reason for the prompt action by governments is that because COVID 19 requires isolation to limit spread of the disease all commerce education entertainment must be suspended. A third reason was that before COVID-19, struck, there were substantial political public protests which had persisted for years in several western democracies. In France where the Yellow Vest protests) (Corbett, Sylvie, 2019) and member countries of the European Union such as the U.K. where Brexit protest lingered on for years (King, 2020) Congregation of large numbers of people in close proximity facilitate transmission of COVID 19. However, preventing people from congregating and peacefully demonstrating their displeasure with government actions infringement on human rights. This comment is not made in the context of a conspiracy theory but identifies what happened and what has been extensively recorded in the international media. (Murphy, S., 2019).

Part of the strategy to contain the spread of the COVID 19 virus has involved sustained lockdown and social isolation which coincidentally brought the earlier political protests to an abrupt end. No doubt, to the relief of those state leaders, who have failed to address the electorate's concerns, about global warming; the inequality of wealth distribution; the militarization of police forces; the excessive use of force by the police; the unending wars on terrorism (a misnomer if ever the was one) ; and pervasive and intrusive CCTV surveillance. All of those activity curtail basic human rights. (Weil, S.,1958).

During the COVID19 crisis, the electorate in most western democracies has been subjected to saturation media blitzes about the COVID 19 virus and its death rate, often to the exclusion of all other important social issues. At the time of this writing, non-

violent protests by the young are beginning to gain traction in the U.S.A., UK, Germany, Australia, Belorussia and many African countries. (Kaplan, Aktar Cassado, 2020).

With COVID 19, most governments have moved rapidly to enforce lockdowns of all citizens and require typically 14-day periods of isolation for those infected with the virus. Closing down most commercial and industrial enterprises; grounding of the world's airlines; closure of state and national borders; closure of schools and universities; Suspension of sports meeting including the Tokyo 2020 Olympics (at the last minute after COVID cases had already occurred in Japan. Internationally all other sports and social gatherings such as weddings funerals and religious services were suspended until further notice. (N.B.C. Sports, 2020); suspension of religious services including weddings and burials or cremations. All of these measures are infringements of basic human rights and are beginning to cause civil unrest and backlash. (Dettmer, 2020).

COVID 19 outbreaks aboard numerous cruise ships were treated by either berthing the liners in port and quarantining all passengers on board whether infected or not or by denying entry of the ship to port so denying them access to onshore hospital and medical facilities and forcing ships to seek safe harbour elsewhere. In both instances, many previously non-infected passengers and crew became infected, and many died. This confinement was a scandalous response to a humane health situation. A similar Covid 19 infection situation later developed on several aircraft carriers of the U.S. Navy stationed in Guam (Starr and Browne, 2020).

Having discussed COVID 19 and the rapid actions by governments to seek to stem the magnitude of it, the researcher now discusses a more serious issue of life and death and compare the tardy response it receives by our leaders and community members.

Global Warming: Natural Planetary Cycle and Human-Produced Effects

The response to global warming by our political leaders at all levels of state and in all countries has mainly been one of denial, which is one way of coping with stress (Mayo Clinic, 2020).

The response to Global Warming by political leaders has been "glacially slow" (in fact glaciers are retreating faster than politicians are acting) and yet Global Warming poses a threat of complete annihilation of humanity and possibly all forms of life on earth. Global warming has already led to the huge loss of animal and plant species (Howard, 2019).

Global warming is known to be caused by both natural long-term unstoppable solar cycle and human made factors which have immediate effect and can be stopped and reversed. The irony is that considerable talk, but little action occurs on Global Warning, which can destroy life on our planet. Whereas, immediate action occurred with Covid 19, which could significantly damage civilization but leave many other species to flourish. (Hays 2020).

We know that both schools of thought on global warming exist, i.e. natural cycle and human-made actions, are causes of global warming. The problem of little or no response to global warming occurs when people take an either/or approach rather than agreeing that both natural cycle and manmade factors are driving global warming. (Herath 2015).

All citizens must demand immediate action by their leaders and ask the question: "Why the lack of urgency and action by government leaders?" (Sparrow, 2019). Additionally, each and every citizen must be prepared to change their behaviour and actions to an environmentally sustainable format. To attain that change it is important

to identify why our politicians and ourselves have failed.

Five Possible Reasons for The Slow Progress by our Leaders on Mitigating the Effects of Global Warming

One reason was eloquently explained in the book and movie *An Inconvenient Truth* (1996) by former U.S. Vice President Al Gore, in his analogy of the frog in the slowly heated beaker of water. The frog remained in the water until it is so hot for it to escape. Had it instead been dropped into hot water it would have immediately sprung out.

A second and philosophical explanation by Philosopher Mathematician Simone Weil (b 1909- d 1943) who believed that humans are conflicted between the present and the future. The conflict leading to either inaction or a tardy response. (Weil, 1958).

A third reason for lack of action by our government leaders to global warming is that governments require revenues in the form of taxes to implement their various social programs. Apart from income taxes, much of that revenue comes from corporate taxes, goods and services taxes and import duties. Thus, government leaders are beholden to energy, mineral suppliers and manufacturers of goods and service providers. They dare not “bite the hand that feeds them”. Similarly, corporations that extract oil, gas, coal and other minerals are beholden to governments which grant them rights to extract those minerals and often provide the infrastructure necessary for movement between source and market. It is a case of "you scratch my back, and I will scratch yours”. (Joondeph, 2019).

A fourth reason for lack of action on global warming arises from two very different beliefs of the cause of global warming. One school of thought is that Global Warming is just part of a natural cycle which the Earth’s geology has recorded for us from time immemorial in geological layers of rocks and polar ice caps. (Hays. 2020). Another school of thought, based on scientific records, is that humanity has induced global warming by burning fossil fuel and in so doing releasing carbon dioxide and other gases into the atmosphere, where they rise to the troposphere and block reflected sunlight escaping back into space. (Herath, 2015).

The fundamental problem here is the denial that both humanmade and natural cycle factors cause global warming. Both factors are proven scientific causes of global warming and must be agreed, for progress to occur in reducing global warming.

A fifth reason is lack of consensus on the cause of global warming is the understanding that over the millennia, humankind has changed from being hunter-gatherer existence to farming, especially in terms of intensive cattle raising. In that process, cattle raised on a diet which produces large amounts of methane in the animals. Released into the atmosphere the methane rises to the troposphere blocking the exit of infrared radiation back into space and raising atmospheric temperatures on Earth. Estimates are that the amount of energy trapped in this manner is the equivalent of 296 times those of motor vehicles. as of 2006 (U.N. News 2006).

To overcome this human dietary issue requires that we substitute vegetable matter for beef in our diet. However, for people to change their diet is no easy undertaking; never-the-less, some companies are now developing vegetarian substitutes for animal protein. (Banman, 2008). “Beyond Meat” is one innovative U.S. start-up offering plant-based meat substitutes. However, until economies of scale can be developed costs are prohibitive (Gelski, 2020)

Humankind Induced Effect - Our Need for Energy to power our electronic devices

Two factors drive our need for energy, one being our burgeoning population (the subject of a proposed future research paper) and secondly our increasingly energy-demanding lifestyle. It is an established scientific fact that enough energy reaches the Earth from the sun in the form of light and heat in one hour to supply the Earth's energy needs for a year. (Tsao, Lewis, Crabtree, 2006) The difficulty is that new energy infrastructure in the form of heliostats must be built. Electrical energy suppliers prefer to keep "milking" Earth's existing energy-inefficient power-generating and transmission grids rather than developing these new systems. Spain and Portugal have heliostat power systems, but they remain of moderate size and are not part of an interconnected heliostat grid. (Zefeng, 2019; Belayakov, 2019)

In a previous incarnation, this researcher was an electrical power engineer. I have subsequently maintained links with the profession and see little change in the alloys and connection hardware in our country's electrical distribution systems except in size. The same relatively inefficient aluminium alloy (twice as resistant to electricity as copper) cables comprise our grids. Copper-based alloy comprises our transformers which consist mainly of silicon-steel alloy laminate cores. The whole system is dated and inefficient. The design of electrical power generators is largely unchanged since they were pioneered by Michael Faraday in 1831. (Meurig,1991) It seems no one is thinking boldly of the next means of energy transmission. We prefer to just inker with current technologies by increasing transmission voltages to reduce current losses. Let us now discuss the two broad segments of the energy market

The Two Broad Categories or Segments of the Energy Market

The Supply Side of The Energy Market

Most of the world's electricity comes from highly polluting coal-fired power stations which will likely remain in service for the next fifty years. (Storrow, 2020)

In the U.S. alone 500 old coal-fired power stations ha(ve been retired in recent years. New natural gas-fired power stations have replaced them. Natural. gas is now the fuel of choice as it has a lower carbon footprint than coal.- The problem is that these new gas supplies are said to be cheaper energy sources rather than less polluting sources (than coal). Being cheaper, they will attract greater use and increase the total amount of carbon and other pollutants in the atmosphere and global warming. (NETL, 2010).

Some readers might respond to this discussion of comparative energy costs by mentioning the increasing use of solar cells atop many commercial and residential buildings. The truth is that the production of solar cells is itself energy inefficient, and the cells are expensive and have a relatively short life. Photocells require regular cleaning to remove atmospheric dust in order to remain efficient. (Lakatos_ Hennessey_& Kovacs, 2020).

Wind farms are another alternative source of energy, but they too, are prone to maintenance failures. At any given time, some wind turbines will be down for maintenance. Over a turbine's lifetime cost may account for 10-35 per cent of the initial installation cost. Twenty five percent of wind turbines on a windfarm are out of action for maintenance yearly. (Wind energy The Facts 2020).

Heliostats which focus the rays of the sun onto a steam generating boiler which in turn drives steam turbine electrical generators inter-connected via a smart grid employing new highly efficient alloy conductors and connectors and radically high-tech transformers plus AC/DC links are required.

However, another alternative source of energy is nuclear fusion (not to be confused with nuclear fission) requiring the use of atomic reactors and the same process employed in nuclear weapons. (Funel, 2020). Within the last 50 years we have witnessed the meltdown of Three Mile Island nuclear reactor in the USA. A catastrophic explosion of a nuclear reactor at Chernobyl in Russia and a meltdown of a nuclear reactor at Daisuke Fukushima in Japan. In each those instances, nuclear radiation was spread worldwide through the winds and in the case of Daisuke-Fukushima also by ocean currents. irradiating all life on earth. (Fennel Mark 2011; Mahaffrey,2015).

Work on nuclear fusion technology commenced in the 1950s when this writer was a primary school student. At that time, this researcher wrote to the British Nuclear Energy Authority for details for a school project and received a hefty information package on the ZETA machine a nuclear-fusion process for producing electrical power undergoing development at the time. During the intervening seventy years, development has continued in the U.K., China in the U.S.A. and Russia but has still to reach commercial viability. (Pogrebnyak, (2010; Polevoi, Ivanov, Yu. Medvedev. Huijsmans, Kim, Loarte. Fable and Kuyanov, 2020)

The Demand side of The Energy Market

Many commercial and residential buildings remain energy inefficient. Two decades ago, energy audits were performed under government encouragement in many countries on commercial and residential buildings and recommendations made to retrofit energy-saving materials. Architects design energy-efficient buildings, but that worthy goal is lost.

I see glass-clad buildings painted black or dark grey to hide insipient dust and dirt on building exteriors and which absorb greater heat from the sun which in turn require more air conditioning to keep the interior tolerably cool for occupants. Curtain walls made of single-plate glass modules instead of vacuum-sealed double or triple-glazed panels. Regular concrete in place of more energy-efficient alternative materials such as vermiculite. (Garg; Kumar; Piprralia.,2016).

Motor vehicles powered by conventional gasoline-powered engines continue to be mass produced. Some of the most popular models are large utility trucks with large diesel or gasoline engines. It is frivolous and wasteful to see these vehicles used for inner-city use rather than cross-country use. A small number of cars such as Toyota Prius are available powered by hybrid (gasoline-electric battery) engines. A tiny number are powered by all-electric engines such as Elon Musk's Tesla cars and hydrogen-fueled engines power a similarly small number are available. However, costs are prohibitively high compared with conventional gasoline-powered vehicles.

Given the seriousness of global warming and atmospheric pollution, to life on earth, conventional gasoline-powered cars should have been withdrawn from manufacture thirty years ago. The U.K. government recently announced that conventional gasoline-powered cars would no longer be available after 2035. (Frangoul, 2020). Whereas car manufacturers and governments in western democracies use the excuse of the cost of deploying re-fueling infrastructure as the reason for the delay in implementing Hydrogen powered motor vehicle refueling infrastructure in China, the manufacturers of those vehicles are funding and constructing the required infrastructure as part of their cost of doing business (Kapustin, Grushevenko,2020).

Shell Petroleum has invested in providing hydrogen auto refueling infrastructure in Europe, U.K., and U.S.A. (Shell Global, 2020).

Immediate cessation of production of gasoline powered vehicles is required rather than "kicking the can down the road". "Out of sight out of mind" (Heywood, 1562) seems to be the appropriate aphorism here.

We now turn to the last of three topics of this research paper namely depletion of the world's finite stock of minerals.

Depletion of the World's Finite Supply of Mineral Resources

A review of the literature suggest that two core factors drive the demand for the world's raw materials.

1. A growing population, the majority of whom have a greater expectation for an increasing number, size and sophistication of accommodation and access to purchase consumer goods? (Stiglitz,2012)
2. A throw-away society.(Britannica, 2008; Packard, V., 1960)

Both of these two issues are the subject of separate recently completed research studies by the author (Barnes 2020b and Barnes 2020c).

The major minerals are silica sand, limestone, metals, coal, oil shale, gemstones, limestone, chalk, dimension stone, rock salt, potash, gravel, and clay. I include potable water to this list as it will become increasingly scarce due to melting of glaciers and the polar and Greenland ice caps. (Barlow Clarke, 2002; Bowman R., 2008; Bozo, 2009; Soechtig; Walrath, 2010).

"A new 2020 World Bank Group Report finds that the production of minerals, such as graphite, lithium and cobalt, could increase by nearly 500% by 2050, to meet the growing demand for clean energy technologies. The World Bank 2020 report estimates that over 3 billion tons of minerals and metals will be needed to deploy wind, solar and geothermal power, as well as energy storage, required for achieving a below 2°C future". (World Bank, 2020).

"The report**"** also finds that even though clean energy technologies will require more minerals, the carbon footprint of their production—from extraction to end-use—will account for only 6% of the greenhouse gas emissions generated by fossil fuel technologies. The report underscores the critical role that recycling, and reuse of minerals will play in meeting increasing mineral demand. The same report also notes that even if we scale up recycling rates for minerals like copper and aluminium by 100%, recycling and reuse would still not be enough to meet the demand for renewable energy technologies and energy storage". (World Bank 2020).

A key point to note here is that population, the underlying core issue is being recorded rather than being managed.

If we look back to early history "At the dawn of agriculture, about 8000 B.C., the population of the world was approximately 5 million. Over the 8,000 years up to 1 A.D. it grew to 200 million (some estimate 300 million or even 600 million, (suggesting how imprecise population estimates of early historical periods can be), with a growth rate of under 0.05% per year." (Malthus (1798; Wesley and Peterson, 2017).

"A tremendous change occurred with the Industrial Revolution: whereas it had taken all of human history until around 1800 for world population to reach one billion, the second billion arrived in only 130 years (1930), the third billion in 30 years (1960), the fourth billion in 15 years (1974), and the fifth billion in only 13 years (1987)".

"During the 20th century alone, the population in the world has grown from 1.65 billion to six billion. In 1970, there were roughly half as many people in the world as there are now. Because of declining population growth rates, it will likely now take over 200 years to double again."

There are already too many people for our planet to sustain an increasingly energy intensive and consumer driven society. We see graphic details on our daily news of vast numbers of people starving and dying of preventable diseases or migrating in order to escape repressive regimes in their homelands. Paul Ehrlich has written about the population bomb but few if any take heed of his research. (Ehrlich, 1968).

Symptomatic of both our burgeoning population and "throw away lifestyle" is exemplified in a recent deep-sea robotic vehicle sent to the Marianas Trench (the deepest part of the Ocean and found plastic refuse there. (Bender, 2006). The 1996 documentary movie "Trashed" informs us that the seafood we consume contains plastic microfibers which enter our bodies when we consume that seafood, doing untold damage to our bodies. The world's oceans contain more plastic particles per million than zooplankton, the simplest form of marine life. (Bobbitt; Ogilvy, & Ditch.2010).

Evidence suggests that a key driver in the overuse of plastic in packaging is that it is "free." That is to say, the cost of plastic packaging is built into the product cost which because of huge packaging volumes is a small portion of the total cost typically amounting to between 1.4 to 11 percent of the total cost (Spitz, 2013) Another factor is that there is no deposit on the container at purchase and so there is no incentive for the purchaser to either return the container when emptied or recycle it. Similarly, there is no incentive by the filler to recover the empty container and wash and recycle it. (Spitz, 2013).

The cost of collection, cleaning for reuse or recycling is avoided and the cleanup cost of discarded plastic is left to the whole community who have become overwhelmed with the litter.

No link has been firmly established in the minds of packaging manufacturers, fillers and end use customers on the true cost of these one-way, non-returnable plastic packages. Collection and disposal costs are just passed onto the wider community whether they be purchasers of those plastic packages or not. This process is another type of "free loading" on the whole community.

Apart from packaging waste, another type of waste concern discarded electronic products and batteries, or cells used to power them.

If we look in our household drawers and cupboard and closets, we will likely find disused electronic items. The writers tally shows in parenthesis. Old and unused mobile phones (3); tablet computers (1); desktop computers (1); laptop computers (3); old radios (3); video players (2); CD-ROM drives (3); Walkman Players (1); tape decks (1); uninterruptable power supplies (3); remote control handset (3). Broken handheld electronic calculators (3) All of these contain valuable and scarce minerals such as gold, silver, copper, tin, antimony, lithium, and silicon, which must be recovered and recycled. Most of our current hand-held electronic devices contain batteries either conventional dry cells or lithium batteries. However, in Bangkok, there is no source to receive and reprocess these valuable minerals. (Carrington, 2020).

To quote Carrington (2020) at length here:

"At least $10bn (£7.9bn) worth of gold, platinum and other precious metals are dumped every year in the growing mountain of electronic waste that is polluting the planet, according to a new U.N. report.

A record 54mllion tonnes of "e-waste" was generated worldwide in 2019, up 21% in five years, the U.N.'s Global E-waste Monitor report found. The 2019 figure is equivalent to 7.3kg for every man, woman and child on Earth. Though concentrated in wealthier nations, the amount of e-waste is rising three times faster than the world's

population. Barely 17% was recycled in 2019.

Electronic and electrical goods, from phones and computers, refrigerators and kettles, have become indispensable in modern societies and enhance lives. However, they often contain toxic chemicals, and soaring production and waste damages human health and the environment and fuels the climate crisis.

The UN 2019 report blames a lack of regulation and the short lifespan of products that are hard or impossible to repair. Experts called the situation a "wholly preventable global scandal".

People in northern Europe produced the most e-waste – 22.4kg per person in 2019. The amount was half as much in eastern Europe. Australians and New Zealanders disposed of 21.3kg per person, while in the U.S. and Canada the figure was 20.9kg. Averages across Asia and Africa were much lower, at 5.6kg and 2.5kg per person, respectively.

E-waste contains materials including copper, iron, gold, silver and platinum, which the report gives a conservative value of $57bn. However, most are dumped or burned rather than being collected for recycling. Precious metals in waste are estimated to be worth $14bn, of which a total of $4bn-worth of waste is recovered through reprocessing activities.

Europe had the highest recycling rate in 2019, at 42%, with Asia second at 12%. Across North and South America, and Oceania, the rate was 9%, and in Africa, it was 0.9%.

In low-and middle-income countries, some e-waste is recycled but usually by unsafe practices, such as burning circuit boards to recover copper. This process releases highly toxic metals such as mercury, lead and cadmium, "causing severe health effects to workers as well as to the children who often live and play near e-waste activities", the report said.

It estimated that 50 tonnes of mercury from monitors, energy-saving light bulbs and other e-waste are dumped in this way each year. Furthermore, gases released from discarded fridges and air-conditioning units were equivalent to 98m tonnes of atmospheric carbon dioxide in 2019, close to the national emissions of Belgium.

"E-waste is a huge problem because the amount is growing at a very rapid pace each year, and the level of recycling is just not keeping up the pace," said Keeps Baldé at the U.N. University, based in Bonn, and an author of the report. "It is important to put a price on the pollution – at the moment it is simply free to pollute".

"The biggest problem is that, in many countries, there are no collection systems", said Mijke Hertoghs, at the U.N.'s International Telecommunication Union. "The companies that bring the equipment on the market are not being held accountable for the end-of-life disposal."

However, Hertoghs said the value of the metals dumped represented an opportunity. Baldé agreed: "If [collection and recycling] were better organized, the economies of scale would go up and I think there are opportunities for creating a new economy and new jobs. There would be a huge income for many people". Recycling would also cut the environmental impact of mining for new metal: "One gram of gold has a massive footprint".

"Improper e-waste recycling is a major emerging hazard, silently affecting our health and that of future generations", said Maria Neira at the World Health Organization. She said one in four childhood deaths resulted from pollution, including e-waste.

Reduce, reuse, reboot: why electronic recycling must lift its game

In 2018, the I.T.U.'s governing body set a target of increasing e-waste recycling from 17% to 30% by 2023. Nevertheless, as things stand, said Hertoghs: "It is unrealistic to achieve that goal". Since 2014, the number of countries with national e-waste policies or laws in place has only increased from 61 to 78, out of a total of 193 UN member states.

Libby Peake from the think tank Green Alliance said: "The ever-growing mountain of e-waste documented in this report represents a wholly preventable global scandal.

"It does not have to be this way", she said. "Products designed to last, to be repaired and, just as crucially, to be upgraded. Ensuring the system keeps electronic products in circulation would create hundreds of thousands of jobs. There is no excuse for leaving this scandal unaddressed (Carrington, 2020).

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